

Expert Commentary Series

John Stone and the “Best of Age of Autism”: Just Plain Wrong About Everything

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February 23, 2017

John Stone (May 10, 2010). “Paul Offit’s 10,000 Vaccines and the Milgram Experiment”. *Age of Autism*. Available at: <http://www.ageofautism.com/2010/05/paul-offits-10000-vaccines-and-the-milgram-experiment.html>

John Stone is listed as the UK Editor for *Age of Autism*, a daily web newspaper. He is author of numerous articles posted on *Age of Autism* as well as an active writer of comments, not only to *Age of Autism* articles; but to articles on other websites, including *Every Child By Two*’s blog, “Shot of Prevention.” I have written a number of commentaries on John Stone and his antivaccinationist views, but after seeing Stone’s article “Paul Offit’s 10,000 Vaccines and the Milgram Experiment,” now being posted for the fourth time, I just had to get out my pen and pad once more. In his article, Stone discusses four topics:

1. Using the Milgram Experiment as an explanation for why doctor’s vaccinate
2. Profits made on the manufacture and sale of vaccines
3. Paul Offit’s oft out-of-context quoted by antivaccinationists “10,000 vaccines”
4. The Cutter Incident

This paper will show that not one of his claims has any validity; but, rather, clearly display many of the flaws in Stone’s thinking as well as other antivaccinationists, including: poor scholarship, a deficient understanding of scientific thinking and methodology, deficient knowledge of immunology, microbiology, and epidemiology, deficient understanding of basic economics, the illogic of false analogies, as well as a lack of common sense, plus a blatant hypocrisy. Stone’s article has been reposted three more times on *Age of Autism* as “Best of Age of Autism” (2011ab,2015), so, not only does this article clearly show the deficiencies in John Stone’s writing; but, if *Age of Autism* editors think this represents their best, an obvious indication of the entire blog’s defects.

The Milgram Studies

I couldn’t help but smile when seeing “the Milgram Experiment.” Fifty years ago I was a graduate student working towards a Masters in Social Psychology. As part of our training we were required to lecture the undergraduate Social Psychology classes. I chose for one of my subjects, yes, you guessed it, the Milgram Experiments. Note, “Experiments”, not Experiment, something Stone seems not to be aware of. The class was in a large amphitheater. There was a morning and an afternoon class. The theater was packed for the afternoon class, far more people than enrolled in the class. I was told later that my morning lecture was so interesting that it attracted many others to the afternoon class. No, I’m not claiming to be some great lecturer; but I must have done something right on that day. Though 50 years ago, I still remember it; but, just to be sure I rifled through some boxes and found the photocopies and reprints of articles I used in my lecture (I seldom throw out anything). In addition to nostalgia, since Stone’s article has been reposted at least

three times as an example of the “Best of Age of Autism,” it presents an opportunity to not only show John Stone’s poor scholarship, deficient science and logic, and lack of common sense; but reflects on *Age of Autism* in general.

Now comes the fun part, reliving my youth and uncovering another example of an antivaccinationist’s poor scholarship. Though *Psychology Today* is a reasonable lay magazine, before assuming that any popular magazine article gives an accurate depiction of any research, that is, if one intends to build a case on it, an honest scholar would go to the actual study and, in addition, research if there have been any additional related studies. Anyone trained in science understands that one study can, by random chance and/or poor design, give results that cannot be replicated. And most people understand that popularized accounts of research may not be completely accurate. Note that Stone’s article also contains a brief scene from the movie “Experimenter” about Milgram’s life (Wikipedia, “Experimenter”). Most people understand that movies take artistic license with what they portray. The bottom line is that Stone is cherry-picking one article (a profile, nonetheless) in a popular lay magazine and scenes from a movie. The choice of sources undermines Stone’s credibility as a serious writer, and by extension, the *Age of Autism* blog that so reveres his writings. So, let’s look more closely at what Stone writes and the actual Milgram Experiments, again more than one.

Stone writes (2010), quoting an article in *Psychology Today* profiling the life of Stanley Milgram (Blass, 2002):

The subjects believed they were part of an experiment supposedly dealing with the relationship between punishment and learning. An experimenter—who used no coercive powers beyond a stern aura of mechanical and vacant-eyed efficiency—instructed participants to shock a learner by pressing a lever on a machine each time the learner made a mistake on a word-matching task.

“In actuality, the shock box was a well-crafted prop and the learner an actor who did not actually get shocked. The result: A majority of the subjects continued to obey to the end—believing they were delivering 450 volt shocks—simply because the experimenter commanded them to. Although subjects were told about the deception afterward, the experience was a very real and powerful one for them during the laboratory hour itself.”

Stone continues:

65% of participants complied with the experiment to the bitter end. Milgram subsequently explained the experiment:

“The legal and philosophic aspects of obedience are of enormous importance, but they say very little about how most people behave in concrete situations. I set up a simple experiment at Yale University to test how much pain an ordinary citizen would inflict on another person simply because he was ordered to by an experimental scientist. Stark authority was pitted against the subjects’ [participants’] strongest moral imperatives against hurting others, and, with the subjects’ [participants’] ears ringing with the screams of the victims, authority won more often than not. The extreme willingness of adults to go to almost any lengths on the command of an authority constitutes the chief finding of the study and the fact most urgently demanding explanation.

“Ordinary people, simply doing their jobs, and without any particular hostility on their part, can become agents in a terrible destructive process. Moreover, even when the destructive effects of their work become patently clear, and they are asked to carry out actions incompatible with fundamental standards of morality, relatively few people have the resources needed to resist authority.”

Stone goes on to write: “Without commenting directly on vaccine science I believe it is possible to recognize the elements of social control here. The authoritarian construction is far more certain than the safety of the products. Offit gives us to understand that even if our children were to receive 10,000 vaccines in one go it would still be safe: therefore there can be no issue over 5 or 10 in one go, or dozens over the course of a childhood. ***In fact, in most cases the practitioners will know only slightly more about the products than the assenting parents.*** [my emphasis] Moreover, everyone has to be persuaded that there are no real long-term adverse consequences, and even where they are apparent they are coincidental.”

Basically, Stone is attempting to draw an analogy between the Milgram Experiments (yep, more than one, something Stone is obviously oblivious to) and doctors, mainly pediatricians, giving vaccinations to children. He is, of course, wrong about “the practitioners will know only slightly more about the products than the assenting parents.” Besides, having taken undergraduate courses in biology and microbiology, doctors have also studied the immune system, microbiology, and infectious diseases in medical school, followed by years of internships/residencies, and doctors attend conferences, read medical journals, and are required to take continuous education courses and, of course, the information on adverse reactions, e.g. Vaccine Information Statements, are available to doctors (see **Vaccine Safety** below for a list of available information on vaccines). Of course, this is typical antivaccinationist beliefs that, despite many years of education and experience, doctors don’t really know any more than Stone and others *sans* education (see also Dunning-Kruger Effect below). However, I’d like to focus on Stone’s use of the Milgram Experiments as an analogy.

False Analogies: As an undergraduate, besides our major, we had to take 60 semester hours (20 courses) from a variety of “general education” courses, one the required general education courses was Logic. We had a text on traditional logic and another book, which I still own, by W. Ward Fearnside and William B. Holther entitled, “Fallacy: The Counterfeit of Argument”, Prentice-Hall, 1959. Chapter 4 is entitled: “False Analogy”: “An analogy is the assertion that things which resemble each other in some respects will resemble each other in some further respect. It is thus a generalization predicting the occurrence of class characteristics.” (Fearnside, 1959, p.22)

From Rational Wiki:

A false analogy is a logical fallacy that occurs when someone applies facts from one situation to another situation but the situations are substantially different and the same conclusions cannot logically be drawn. Sometimes these differences are outright ignored by the person presenting the fallacy; other times, they may not be aware of the differences. The fallacy occurs, and is common, because real-world parallels are always limited; the differences between things can often overpower their similarities. Analogies and metaphors can be very useful to explain things to people and often play an important part in learning. However, because of the prevalence of false analogies, they’re much less useful in making arguments. (Rational Wiki. “False analogy; see also Wikipedia. “Argument from analogy”)

From the Skeptic's Dictionary:

A false analogy is an unjustified inference drawn on the basis of similarities between two items or types of items. The justification of an inference based on analogical reasoning depends on the number and strength of known similarities and dissimilarities of the items being compared. If there are very few known similarities or if there are a few known very great dissimilarities, then drawing inferences based on the comparison is unjustified. The result is a false analogy. (Carroll, 2016)

And one final example: "A fallacy in which an argument is based on misleading, superficial, or implausible comparisons." (Nordqvist, 2014)

The Milgram Experiments: So, let's look more closely at the Milgram Experiments, that's right, once more, there were more than one. First, Stone bases his article on one second-hand synopsis of the Milgram Experiments. Typical cherry-picking, finding what fits his preconceived agenda and using it. For example, one of Stone's quotes from the *Psychology Today* article is NOT accurate: "An experimenter—who used no coercive powers beyond a stern aura of mechanical and vacant-eyed efficiency." (Blass, 2002) Let's go back to Milgram's original research article published in the *Journal of Abnormal and Social Psychology* in 1963 and see how the author described the experiments he conducted:

Volunteers were recruited to participate in an experiment to evaluate the role of punishment in learning.

[The procedure] . . . consists of ordering a naive subject to administer electric shock to a victim. . . As the experiment proceeds the naive subject is **commanded to** [my emphasis] administer increasingly more intense shocks to the victim. . . In order to improve credibility the experimenter declared, in response to a question by the learner: "Although the shocks can be extremely painful, they cause no permanent tissue damage." . . . if the subject indicated his unwillingness to go on, the experimenter responded with a sequence of "prods," using as many as necessary to bring the subject into line.

Prod 1: Please continue, or Please go on.

Prod 2: The experiment requires that you continue.

Prod 3: It is absolutely essential that you continue.

Prod 4: **You have no other choice, you must go on** [my emphasis]. (Milgram, 1963, pp. 371-374)

So, contrary to the quote Stone seized from the lay article in *Psychology Today*, citing that "no coercive powers" were used, in Milgram's original research paper (which is freely available on the internet) the approach used by the experimenter was nothing short of coercive. Why would Stone rely on a lay summary instead of on the original work where the experiments were described by the experimenter? Well, it's either because (1) this is Stone's modus operandi, (2) the lay article fit better with his agenda than did the actual details of Milgram's experiments, or (3) both. I will be generous and go with number 3.

So, using the actual facts of the Milgram experiments, the analogy Stone is trying to make completely falls apart, unless now Stone wants to take it up a notch and have us believe that the doctor, usually a pediatrician, is being instructed by some entity (probably government storm troopers) that he/she has "no other choice" and absolutely must administer that vaccine.

Besides, as discussed above, doctors have extensive training and knowledge of our immune system, of infectious disease, and, despite the incorrect beliefs of antivaccinationists, the benefits and risks of vaccines. There is no one directly “commanding” the doctor and while he/she is encouraged by various institutions, The CDC Advisory Committee on Immunization Practices, American Academy of Pediatrics, American Academy of Family Physicians, American College of Obstetricians and Gynecologists (2016) to vaccinate (see CDC, 2016), there are no penalties for not vaccinating or maintaining a certain level of vaccinations in his/her practice, though some health care plans offer small incentives/bonuses. The doctors are certainly not being “commanded” to vaccinate.

For the sake of completeness on this topic, the original Milgram Experiment, as presented in the *Psychology Today* article, was just the first of several experiments.

One key variant was the immediacy of the victim, consisting of four experimental conditions:

1. “The victim was placed in another room and could not be heard or seen by the subject.”
2. Same as 1, except that “voice protests were introduced.”
3. Same as 2, except that “the victim was placed in the same room as the subject, and 1 1/2 feet from him.”
4. Same as 3, except “the victim received a shock only when his hand rested on a shockplate. If the victim “refused to place his hand on the shockplate. The experimenter ordered the naive subject to force the victim’s hand onto the plate.” (Milgrim, 1965, pp.61-62)

The results were that 34 per cent of the subjects defied the experimenter in the Remote condition, 37.5 per cent in Voice Feedback, 60 per cent in Proximity, and 70 per cent in Touch-Proximity.

Another key variant involved the closeness of authority where the physical closeness and degree of surveillance of the experimenter was varied. “In one condition the experimenter sat just a few feet away from the subject. In a second condition, after giving initial instructions, the experimenter left the laboratory and gave his orders by telephone; in still a third condition the experimenter was never seen, providing instructions by means of a tape recording activated when the subjects entered the laboratory. . . Obedience dropped sharply as the experimenter was physically removed from the laboratory.” (ibid, p.65)

So, when there was NO direct surveillance, most subjects refused and when having to actually touch the “victim”, again, most subjects refused. So, obviously, in the pediatrician’s office, he/she is actually touching the child, actually seeing the child’s reactions, and no type of coercive surveillance is present. In other words, Stone’s use of the Milgram Experiments is clearly a FALSE ANALOGY. Of course, in his mind, finding a second-hand article was all he needed. No evidence whatsoever that he attempted to learn more about the Milgram Experiments. Vintage Stone and vintage antivaccinationist poor scholarship.

Though it would go too far afield, the Milgram Experiments have been criticized from a number of perspectives, including validity and interpretations. For those interested, I suggest starting with the following:

Orne, Martin T. & Holland, Charles H. (1968). On the ecological validity of laboratory deceptions. *International Journal of Psychiatry*; 1(1): 282-293.

Romm, Cari (2015 Jan 18). Rethinking one of psychology’s most infamous experiments. *The Atlantic*. Available at: <http://www.theatlantic.com/health/archive/2015/01/rethinking-one-of-psychologys-most-infamous-experiments/384913/>

Russell, Nestar (2014 Apr 15). Stanley Milgram's obedience to authority "relationship" condition: some methodological and theoretical implications. *Social Sciences*; 3(2): 194-214. Available at: <http://www.mdpi.com/2076-0760/3/2/194>

Shermer, Michael (2012 Nov 1). What Milgram's shock experiments really mean: replicating Milgram's shock experiments reveals not blind obedience but deep moral conflict. *Scientific American*. Available at: <http://www.scientificamerican.com/article/what-milgrams-shock-experiments-really-mean/>

If one chose to stretch the idea of surveillance, the Health Effectiveness Data and Information Set (HEDIS) is one possibility. HEDIS "is a tool used by more than 90 percent of America's health plans to measure performance on important dimensions of care and service," (National Committee for Quality Assurance, 2016) a sort of report card. Childhood vaccination rates among practitioners is one of the measures. Basically, a random sample of pediatricians contracted with a health plan undergoes a chart audit of their patients. The respective health plans may follow-up with, for instance, computerized reminders to those physicians whose numbers were low. This doesn't even remotely resemble having an authority figure directly supervising and pressuring them to vaccinate an individual child who is directly in front of them.

Should Doctors Work For Free???

Leading into his article, "Paul Offit's 10,000 Vaccines and the Milgram Experiment," Stone writes:

Question: "How many vaccines is it safe for a pediatrician to give a two month old infant?"

Answer: "It depends how much they are getting paid." An old joke

I tried to find the origin of the "old joke". The only citations I could find were from John Stone. I guess he finds it be a real knee-slapper. Yes, doctors do get paid for administering vaccines. Should they work for free, or maybe it is just wrong for doctors to charge for services Stone and other antivaccinationists disagree with, a shifting set of criteria?

Stone ignores the fact that the CDC Advisory Committee on Immunization Practices, American Academy of Pediatrics, American Academy of Family Physicians, American College of Obstetricians and Gynecologists (2016) all recommend vaccinations, as well as the extensive documentation on the safety and benefits of vaccines (e.g., American Academy of Pediatrics (2012); CDC, 1999; CDC, 2015abc; Plotkin (2013); Roush, 2007; WHO, 2016). In other words, when doctors vaccinate, they act based on extensive data showing the schedule is safe, data that led professional associations and expert bodies to recommend doing so. What does Stone base his position on? From his writings there is NO indication he has devoted considerable time and effort into learning even the basics of medicine, immunology, microbiology, epidemiology, biostatistics, public health, and other relevant disciplines.

As an analogy, the American Diabetes Association recommends, as part of a comprehensive diabetes evaluation, both fasting glucose, Hemoglobin A1c and a Fasting lipid profile (American Diabetes Association, 2016). Doctors, of course, charge for these tests. Yes, there is a charge for each lab. And the recommendations include an annual dilated eye exam. The ophthalmologist or optometrist charges for the eye exam and more for a dilated exam (ibid). So, according to Stone, the doctors are performing the dilated exam not because it is in the diabetic patient's best interest but because they can charge more for it. Does Stone think that doctors should ignore the recommendations of both their professional organizations, the CDC, and guidelines developed by respected committees? Does Stone really believe that doctors' sole

motive is money, not trying to help their patients? Or, perhaps, it would be more acceptable if doctors worked for free? And, as discussed above, despite Stone's belief that doctors have no more understanding of vaccines than parents, they do receive extensive training that provides them with extensive knowledge in the subject matter. So, Stone's "old joke" is absurd. Doctors vaccinate because it is what is expected of them and, yes, they don't work for free. Or, is it just wrong for doctors to charge for services Stone and other antivaccinationists disagree with, a shifting set of criteria?

As it turns out, doctors sometimes lose money or barely break even in regard to vaccinations. "About one in 10 doctors who vaccinate privately insured children are considering dropping that service largely because they're losing money when they do it, according to a new survey. . . . Reimbursement concerns were behind an exodus of doctors from vaccine programs in the 1980s." (Stobbe, 2008) A large survey found:

Approximately half of the respondents reported that their practice had delayed the purchase of specific vaccines for financial reasons (49%) and experienced decreased profit margin from immunizations (53%) in the previous 3 years. Twenty-one percent of respondents strongly disagreed that "reimbursement for vaccine purchase is adequate," and 17% strongly disagreed that "reimbursement for vaccine administration is adequate." Eleven percent of respondents said their practice had seriously considered whether to stop providing all vaccines to privately insured children in the previous year. (Freed, 2009)

An Institute of Medicine (IOM) report (2003) found the following:

Childhood immunizations are provided to the public through two main venues: private office-based providers and public health clinics. Before the implementation of the Vaccines for Children (VFC) program, private providers generally immunized privately insured individuals, and public clinics immunized safety net populations. As discussed earlier, one of the goals of the VFC program was to increase the proportion of children who receive vaccines in their medical home. Almost overnight, VFC expanded the number of publicly certified immunization providers from about 3,000 public immunization sites to more than 40,000 public and private provider sites. (IOM, 2003, p.92)

While many clinicians receive vaccines at no cost through the VFC program, most clinicians (in non-universal purchase states) purchase additional stocks for both private and public patients who do not qualify for VFC. As a result of the increased cost and growing number of vaccines in recent years, these purchases have become a sizable investment, typically tens of thousands of dollars for a busy pediatric practice. Providers frequently must price shop by contacting multiple vaccine distributors. . . . For providers in capitation arrangements, expensive new vaccines and expanded eligibility have resulted in a significant cost burden on provider. . . . Delays in public funding and managed care contracts for new vaccines have also caused significant problems in physicians' offices. The AAP has received reports from pediatricians who owe significant amounts of money for pneumococcal conjugate vaccines that they purchased anticipating eventual third-party reimbursement. Many found that the reimbursement they received did not adequately cover the price of the vaccine or that third-party payors were not providing reimbursement at all. The AAP has also received reports from physicians who had to take out lines of credit to meet payroll costs and remain open because of the loss of income they experienced in providing this vaccine. And the AAP has learned of physicians who, because of cost considerations, are contemplating referring children to a public clinic rather than providing the vaccine in the children's medical home. . . . Beyond problems of paying for vaccine, pediatricians are

faced with an interim period during which some children are covered for the vaccine but not others, and the physician must either provide differential service depending on children's insurance status or find a way to pay for those children not covered. The problems this situation engenders go beyond those associated with bookkeeping. (ibid, pp.94-5)

Vaccine reimbursements are usually based on a statewide or national average price benchmark, such as the average wholesale price. Providers hope that the vaccine reimbursement and administration fee, combined, will at least cover the price of the vaccine. (ibid, p.99)

Current provider reimbursement does not reflect the increasing burden of immunization. Provider reimbursements for vaccine and administration fees often barely cover the costs of vaccine purchase. In many cases, providers lose money on immunization (Glazner et al., 2001). When confronted with inadequate compensation, providers may choose to immunize anyway and absorb the losses; or they may refer patients to public clinics. While it is not clear how high provider fees should be, the evidence suggests that in the long run, inadequate compensation may compromise the viability of the private provider system for immunization. . . That physicians refer substantial numbers of children to public clinics is well documented, even when the children are eligible for free VFC vaccines. (ibid, p.101)

In an article on vaccine pricing and cost, the following costs to a private practice were discussed:

1. *Purchase price (acquisition cost) of the vaccine.*
2. *Personnel costs for ordering and inventory:* Medical office staff (clinical and administrative) time to monitor vaccine stock; place orders; negotiate costs, delivery and payment terms; and ensure safe storage procedures (locks, alarms, temperature controls, etc.)
3. *Storage costs:* Vaccines must be stored at very specific temperature range and, therefore, require special monitoring and storage equipment.
4. *Insurance against loss of the vaccine.* Professional liability malpractice insurance does not cover vaccine product.
5. *Recovery of costs attributable to inventory shrinkage, wastage, and nonpayment.* This includes drawing up the vaccine and having the patient/family reconsider and refuse, resulting in subsequent nonpayment, or a loss of dose. This would also include collection costs in response to nonpayment by the patient or third-party payer.
6. *Lost opportunity costs:* This is the cost of maintaining a large vaccine inventory. Between \$10,000 and \$15,000 in inventory is maintained per pediatrician or other provider of vaccines. Every business with this level of money tied up in product inventory must receive an appropriate return on its investment, and so should every pediatric practice. (American Academy of Pediatrics, 2012b)

Do some private practice doctors make money on vaccines? Of course; but it is a minor part of their practice and they are following the recommendations of the professional organizations to which they belong. If, however, some doctor were to, for instance, vaccinate children in the US for cholera, yellow fever, or some other disease neither present in this country nor recommended, then, and only then, would Stone's absurd "old joke" have any validity.

Stone lives in the UK and, perhaps, he is addressing circumstances there?

One British physician writes: “As a GP I receive incentive payments for achieving immunization targets. In our practice of six partners, I calculate that in 2002 we received about 95p each for every immunisation carried out. Unfortunately, in the degraded climate of discussion that surrounds this issue, anti-MMR campaigners have a penchant for alleging conflicts of interest and corrupt influences on those who express support for MMR. So, if you can call it such, I declare this interest. (Fitzpatrick, 2004, p.xi)

According to the National Health Service (NHS), England “General Medical Services Statement of Financial Entitlements Directions 2013”, childhood vaccines and immunisations comprise 1.0 percentage of the initial Adjusted Global Sum Monthly Payments to practitioners (NHS, 2013, p.10) Section 11-14 deals with vaccines and immunisations. (ibid, pp.43-57) Payments are based on the practitioner “hav[ing] completed the recommended immunisation courses (i.e. those that have been recommended nationally and by the World Health Organisation)” (ibid, p.43) “only completed immunisation courses (whether or not carried out by the contractor) are to count towards the determination of whether or not the targets are achieved.” (ibid, p.44) Payments are higher for higher completed immunisation courses. In other words, the National Health Service has designed its compensation program to encourage doctors to give ALL of the recommended vaccinations. So, even more than in the U.S., the UK has designed its vaccine compensation so that doctors follow it. “As from 1 April 2016, all fees vaccines and immunisations have been uplifted to £9.80, as part of the 2016/17 contract agreement.” (BMA (2016 Sep 20). Vaccinations and immunisation guidance. Available at: <https://www.bma.org.uk/advice/employment/gp-practices/service-provision/vaccination>.”

See also:

BMA NHS Employers (2015 Aug). Vaccination and Immunisation Programmes 2015/16: Guidance and Audit Requirement at: <http://www.nhsemployers.org/~media/Employers/Documents/Primary%20care%20contracts/V%20and%20I/V%20and%20I%20Home%20Page/2015%2016%20VI%20guidance.PDF>

BMA NHS Employers (2015 Mar). 2015/16 General Medical Services (GMS) contract: Guidance for GMS contract 2015/16 at: <http://www.nhsemployers.org/~media/Employers/Documents/Primary%20care%20contracts/GMS/GMS%20guidance%202010-present/2015-16/201516%20GMS%20Guidance.pdf>

So, yes, doctors in both the US and UK are compensated for providing vaccines; but it is encouraged by both governments, by prevailing professional guidelines, and by their respective professional organizations, based on extensive research. Apparently, the UK does a better job of ensuring compensation. However, according to Dr. Fitzpatrick and the 1.0% given in the National Health Service document, vaccines are not exactly a road to riches. Whether Stone and other antivaccinationists like it or not, doctors should be compensated for carrying out what is expected of them, what they, based on extensive training and guidelines based on extensive research, believe is in their patients’ best interest.

As an aside, vaccines are not a major source of income for pharmaceutical companies. They are biologics requiring much more difficult production processes and, since the majority are purchased by governments who negotiate price, the net profits for vaccines are far less than for many other pharmaceuticals. According to the IOM report:

Government . . . negotiates contracts for more than half of the childhood vaccines purchased in the United States.” (IOM, 2003, p.52) “Vaccines are a very small enterprise relative to the pharmaceutical industry overall: vaccine revenues constitute only about 1.5 percent of global pharmaceutical sales. Global sales of all vaccines combined are roughly equivalent to the individual sales of such familiar pharmaceutical products such as Lipitor, Prilosec, and Zocor. (ibid, pp.107-8)

While many pharmaceuticals are manufactured with relatively standardized chemical engineering processes, vaccine manufacturing is less standardized and less predictable. It often involves the complex transformation of live biologic organisms into pure, active, safe, and stable immunization components. Highly sterile, temperature-controlled environments are needed at each manufacturing step, and many vaccines must be maintained within a narrow temperature range during storage and delivery—referred to as the cold chain. Vaccines approved by the Food and Drug Administration (FDA) are subject to high standards of safety and quality assurance, including rigorous and pervasive review procedures in which each individual batch of vaccine is licensed—a procedure not required for pharmaceuticals.

In addition, once in production, each batch must be tested and approved prior to release. Vaccines require both a product license application (PLA) and an establishment license application (ELA), while new pharmaceutical products (“new chemical entities” or NCEs) require only the former. The ELA certifies that the facilities, equipment, and personnel involved in the manufacturing process meet FDA standards and Current Good Manufacturing Practices. Furthermore, to obtain a facility license for a vaccine, a company must first create full production capacity for that vaccine. (ibid, p.109; see also Baylor, 2013; CDC, 2015c; Gomez, 2013)

So, despite what antivaccinationists choose to believe, vaccines are not a highly profitable segment of the pharmaceutical industry. In addition, do antivaccinationists believe the pharmaceutical industry should offer vaccines for free, at cost, or even take a loss? I haven’t seen antivaccinationists criticize the pharmaceutical industry for profiting from antibiotics or insulin or chemotherapy, etc. Yes, the industry has been criticized for excess profits; but no one to my knowledge believes they should lose money. And, as mentioned below, antivaccinationists, among them John Stone, seem to have NO problem with purveyors of complementary and alternative medicines making a profit.

I’ve already discussed the “10,000 vaccines” in detail in a previous article for *Every Child By Two* (Harri-son, 2016a); but, given just how wrong Stone is about it, as everything else, I think it appropriate to discuss it once more.

10,000 Vaccines: Ignoring Context and a Lack of Common Sense:

The basic points made in my article were:

1. The quote of 10,000 vaccines was a single sentence taken out of context, given that Offit’s entire article involved detailed explanations of how our immune system works and the incredibly vast number of microbes it is exposed to and capable of dealing with at any single point in time (Offit, 2002). In a later talk available on YouTube Dr. Offit again devotes the entire discussion to the immense capacity of the immune system with one sentence mentioning “100,000 vaccines” (Offit, 2008). For more on the myriad of microbes our immune system must deal with on a daily basis, see, for instance: Mars- ton, 1999; news.com.au, 2013; Park, 2015; and Wilson, 2005.

2. The current number of microbes that children are routinely vaccinated for is 17 and even these are not given at one time. There are only about 200 microbes that vaccines are being developed for and most of these would not be applicable to children in the US or Europe, so, at most, perhaps a half dozen or so vaccines may come into use in the foreseeable future.
3. It would be both physically impossible, even if one combined five vaccines per shot, and absolutely macabre to even attempt to at one time to inoculate an infant or even an adult with 2,000 shots. (see my article, Harrison, 2016a)

Stone (2010) refers to a comment by David Salisbury, appearing “on television declaring it was safe to give an infant 1,000 vaccines”, then goes on “he admitted to me:” quoting from an e-mail he allegedly received from Salisbury that stated:

"Turning to my comments on Newsnight - I suggest you read Paul Offit's paper - as I have done. On page 126, he states: "Current data suggest that the theoretical capacity determined by diversity of antibody variable gene regions would allow for as many as 10⁹ (1,000,000,000) to 10¹¹ (100,000,000,000) different antibody specificities". And "... then each infant would have the theoretical capacity to respond to about 10,000 vaccines at any one time" - not antigens. I was speaking very specifically about the infant immune system's ability to respond, in the context of the ridiculous suggestion that the new vaccine combination, containing far fewer antigens than the one it will replace, would overload the immune system. My words were "The immune system of a baby has got huge spare capacity to deal with challenge. If we didn't, the human race wouldn't survive. But let's look specifically at vaccine. This has been studied carefully. A baby's immune system could actually tolerate perfectly well 1,000 vaccines". At no point did I suggest that 1,000 vaccines would not increase the probability of adverse reactions - a quite different matter." (Email August 26, 2004 10.03 am)

Note that there is NO way to know the authenticity of the e-mail nor if authentic if Stone selectively edited it.

Stone goes on to write: “We are, of course, not talking about theoretical vaccines or theoretical infants, nor is there any experimental base that he can cite.”

Stone apparently didn't take Salisbury's advice to actually read Offit's original article, didn't understand it, or simply sticks with his rigid ideology regardless; but even from the brief e-mail, it is clear that Salisbury is speaking about the infant immune system's ability to respond. Stone lacks the common sense to understand that it would be virtually physically impossible to inoculate an infant with 1,000 vaccines at once or even several hundred (if one combined five vaccines per shot).

Stone apparently doesn't understand that there are only 14 vaccines currently given before age 6 and 16 vaccines by age 18, nor does he understand that there are only 17 microbes that we currently inoculate for, so how does he imagine 1,000 vaccines? (CDC, 2016; FDA, 2015; Kids Health, 2016; Kroger, 2013; National Vaccine Information Center, 2016). He is right that there are NO experimental studies on inoculating with so many vaccines; but there is ample research on the immune system and its capacity, something that Stone is apparently completely ignorant of. Even his lead sentence, “he admitted to me,” is absurd in that Salisbury isn't admitting, he is explaining. Obviously Stone wants to bias the reader. And there are many studies involving the safety of combination vaccines (e.g. Decker, 2013; Halsey, 2001)

Stone wrote in a comment to another of his articles (Stone, 2016):

I wasn't going to post you again making the same assertion that you understand things and we don't but should there be any doubt about what Dr. Offit has said about this matter here he is in a CHOP pamphlet saying just what he said about "one" being able to take 100,000 vaccines every day only about babies specifically:

"But it should be the least of your worries. "Children have an enormous capacity to respond safely to challenges to the immune system from vaccines [my emphasis]," says Dr. Offit. 'A baby's body is bombarded with immunologic challenges - from bacteria in food to the dust they breathe. Compared to what they typically encounter and manage during the day, vaccines are literally a drop in the ocean.' In fact, Dr. Offit's studies show that in theory, healthy infants could safely get up to 100,000 vaccines at once."

Admittedly there seems to be an obsession with the decimal system, and I am prepared to go with 10,000 if that is his final decision. [my emphasis] (Posted by: John Stone | January 07, 2016 at 11:14 AM)

Stone refers to a reposting of a CHOPS pamphlet, the October 2005 Issue of "Parents Pack Newsletter":

Your child can receive up to 23 shots by the time she's 2 years old and as many as six shots at a single doctor visit.

"Children have an enormous capacity to respond safely to challenges to the immune system from vaccines," says Dr. Offit. "A baby's body is bombarded with immunologic challenges - from bacteria in food to the dust they breathe. Compared to what they typically encounter and manage during the day, vaccines are literally a drop in the ocean." In fact, Dr. Offit's studies show that, in theory, healthy infants could safely get up to 100,000 vaccines at once. (Stone hyperlinks to www.whale.to)

In another comment to his article (Stone, 2016), Stone writes:

And he told me in his email which I published in my earlier article that he was quoting Offit should there be any doubt. It is quite clear that he was trying to re-assure parents about the safety of administering multiple vaccines and actually it is quite clear that that was what Offit was doing. Our British health officials cite Offit but actually Offit cites a 1990 paper by Cohn and Langman - I can't download the Cohn and Langman paper so the context of that and how Offit adapted it for his purposes is unclear. It does not look like a paper on vaccination at all. However, in the interview linked to by Angus below we see Offit breezily telling an audience in 2008 that an infant could happily withstand 100,000 vaccines a day (yes, every day). I see very little alternative to the view that that is exactly what he meant, crazy though the proposition is. Maybe he should have spoken more carefully if he did not want to be misunderstood.

Posted by: John Stone (<http://www.ageofautism.com/john-stone-uk/>) | January 06, 2016 at 04:48 AM (<http://www.ageofautism.com/2016/01/bexsero-more-questions-for-the-british-and-scottish-governments-over-vaccine-committee-chair.html>)

So, Stone couldn't download the Cohn and Langman (1990) paper; but then, obviously without reading it, states: "It does not look like a paper on vaccination at all." Can one make a more stupid statement than

this? Apparently Stone doesn't hesitate to comment on papers he hasn't read, nor does he understand that ***vaccinology is simply applied immunology***. As an aside, neither could I download the Cohn and Langman article, so I obtained it through a local university. And, yes, I did read it. And Stone goes on to write: "we see Offit breezily telling an audience in 2008 that an infant could happily withstand 100,000 vaccines a day (yes, every day)." Again Mr. Stone is zooming onto one sentence after a long discussion of the ability of our immune system to deal with far more than 100,000 microbes at a time. Stone either didn't understand this or intentionally ignored it; but he is obviously taking the statement out of context. It is clear from, not only the interview and Offit's article; but also the above quote from a CHOP's pamphlet that Offit, in context, is explaining the enormous capacity of our immune system to respond to challenges and clearly includes "in theory" the number of vaccines, that is the number of antigens (parts of microbes) a child's immune system could deal with. It should be clear from the context and the use of the words "in theory" that 100,000 vaccines at once could NOT possibly refer to a concrete number of vaccines; but the theoretical capacity of our immune system to respond to immunologic challenges.

For those open-minded enough to want to learn the basics, I suggest, to start with, a delightful little introduction to the immune system: Lauren Sompayrac. *How The Immune System Works* (5th Edition). Wiley Blackwell. Also, just go to your local library and check out the past 20 years or so of *Scientific American*, lots of excellent articles on the immune system.

I encourage the reader to check out my article on the "10,000" (Harrison, 2016a) and the exchange between Stone and myself (Stone, 2016)

Vaccine Safety: And another statement by Stone (2010) that is simply WRONG:

"But it is interesting to note that Offit provides a theoretical proposition which does not even depend upon the product: never mind how many there are (and how different they are) they are all safe and perfectly manufactured – it is as if they do not even have to be tested. Indeed, however dramatic the adverse effect, they know in advance it wasn't the vaccine."

The above statement is entirely false. Neither Offit nor anyone else has claimed that vaccines "are all safe . . . it is as if they do not even have to be tested." I doubt there is any product on the market more tested than vaccines (see pages 20-21 in Harrison, 2016b).

No one, not the CDC, not the FDA, not the Institute of Medicine, nor any of the credible vaccine-promoting organizations have ever claimed that vaccines are absolutely without risk. What they have claimed, based on extensive research, is that the risks posed by the vaccines are exponentially lower than the risks posed by the natural diseases they protect against. And the risks are available for anyone interested in them:

1. By law, every time a vaccine is given, a vaccine information statement must be given, either to the parent or guardian or the adult recipient. These sheets include lists of common mild adverse events and rare serious ones. (CDC, Vaccine Information Statements, Available at: <http://www.cdc.gov/vaccines/hcp/vis/>)
2. The CDC's book, "Epidemiology and Prevention of Vaccine-Preventable Diseases: The Pink Book, 13th Edition (2015)" contains comprehensive chapters of all vaccine-preventable diseases and can be read online or downloaded as a pdf for free. Available at: <http://www.cdc.gov/vaccines/pubs/pink-book/index.html>

3. Institute of Medicine reviews of vaccine safety can be read online or downloaded for free by a simple signing up process. Available at: [http://www.nationalacademies.org/hmd/Reports.aspx?fil-
ters=inmeta:activity=Immunization%20Safety%20Review](http://www.nationalacademies.org/hmd/Reports.aspx?fil-
ters=inmeta:activity=Immunization%20Safety%20Review))
4. The CDC Vaccine Safety webpage includes a list of peer-reviewed studies. Available at: <http://www.cdc.gov/vaccinesafety/index.html>
5. And Every Child By Two's website includes discussions of vaccine safety, including: "As with any medication, side effects can occur after vaccination. However, these side effects are usually minor and most often include tenderness at the injection site and a low fever (which is actually a positive sign that the body is doing its job by reacting to the vaccine). Severe reactions to vaccines are very rare. Information about possible adverse events are available in the ACIP's recommendations for each vaccine. Information for the public on possible side effects after vaccination can be found on each vaccine's Vaccine Information Statement." (Every Child By Two, Available at: http://www.ecbt.org/index.php/facts_and_issues/article/vaccine_safety)
6. Check out an excellent book, Stanley A. Plotkin, Walter A. Orenstein, Paul A. Offit (Eds.) (2013). Vaccines (Sixth Edition). Elsevier/Sanders. The book is rather expensive; but many university libraries have a copy, perhaps of an earlier edition. The extensive reference list, often almost 400 articles/documents for one chapter are available online.

As for Stone's: "Offit gives us to understand that even if our children were to receive 10,000 vaccines in one go it would still be safe: therefore there can be no issue over 5 or 10 in one go, or dozens over the course of a childhood." Not to beat a dead horse; but that is the entire point of Offit's discussion of the immense potential of our immune system that a few vaccines, at most six at one time, pale in comparison to the myriad of microbes our bodies are exposed to at any given time. And these microbes are fully functional, whereas vaccines represent either killed or severely weakened ones.

Finally, as a poor analogy, imagine being hit by a fully inflated basketball thrown by someone quite strong and compare that with being hit with three water balloons. Prior to vaccinations, more than 90% of children experienced most, if not all, of the childhood diseases as well as minor food poisonings, colds, flu, cuts and scratches with potential infections. How could a few killed or severely weakened microbes, together with minute amounts of substances that are ubiquitous in our environment, be responsible for all the harms claimed by antivaccinationists?

The Cutter Incident: Stone (2016) writes: "There is no given that any of the products are individually safe - Offit himself wrote a book about the Cutter incident. That was just a single vaccine that caused havoc. 10,000 vaccines isn't science it is sales pitch used as sales pitch. Posted by: John Stone | January 07, 2016 at 01:58 PM"

Stone thus implies that the Cutter incident should be taken as evidence that vaccines are unsafe. Let's look at the Cutter Incident.

The Cutter incident occurred in April/May of 1955 (61 years ago). It was a horrible tragedy. On April 12, 1955, the results of the largest randomized clinical trials ever conducted in the US, the Salk polio vaccine, was announced to the world. For years, on the average, 15,000 Americans, mainly children, had suffered paralysis and even death from polio. The polio season was rapidly approaching. There were only three pharmaceutical companies that were experienced vaccine manufacturers. They did not have the capability to produce enough vaccine for all American children. There were two choices: 1. wait out another season with another anticipated 15,000 or so paralyzed children or 2. find additional companies willing to produce the vaccine. The latter choice was taken. Cutter Industries, outside of San Francisco, was one of the two additional companies contracted with. Unfortunately, they failed to completely kill the polio viruses

contained in some lots of their inactivate poliovirus (IPV) vaccine resulting in 200 paralyzed recipients and tens of thousands possibly exposed to live viruses. However, Cutter Industries did NOT intentionally take short cuts to save money. In fact, Cutter employees were the first to line up to get their children the vaccine. Over the years, besides Dr. Offit's superb book (Offit, 2005) on the incident, I have read dozens of medical journal articles and chapters in books on it and every time I think of it, I shudder that it could have been me. Just as an aside, I was among the first cohort of children in 1955 to get the Salk vaccine and I lived in an area of the country that used the Cutter vaccine. So, I am quite aware that I may have ended with paralytic polio from the Cutter vaccine and dodged a bullet. I am very cognizant of what happened. For those interested in exactly what went wrong, read Chapter 6 of Dr. Offit's book, "What Went Wrong at Cutter Laboratories." (Offit, 2005, pp.103-131)

As Dr. Offit writes in his book:

THE CUTTER INCIDENT HAS MANY LEGACIES. For one thing, the incident led to the effective federal regulation of vaccines. Because Cutter Laboratories made a vaccine that caused paralysis, the federal government launched an immediate investigation into the manufacture and testing procedures of all companies; it found that regulations and guideline were inadequate. Better procedures for filtration, storage, and safety testing were developed, and within months safe polio vaccine was made. . . On July 15, 955, only three months after the incident, the Laboratory of Biologics Control became the Division of Biologic Standards, a separate division within the National Institutes of Health. By 1956 the number of professionals regulating vaccines increased from 10 to 150. . . A series of consecutive lots of vaccine that are equal in potency, safety, and efficacy continues to be required of all vaccine makers. . . Vaccines are arguably held to a higher standard of safety than any other product given to children, including antibiotics and cough and cold preparations. (ibid, pp.178-179)

And, "Since the Cutter incident and the safety measures instituted as a result of that experience, there has been no evidence for defective manufacture of IPV." (Vidor, 2013, p.591) For more on the development of safety regulations for drugs in general and vaccines specifically, see Baylor, 2013; FDA "About FDA"; Hiltz, 2003. Though NOTHING that we take into our bodies or are exposed to is perfectly safe and, as discussed above, vaccines do have risks, though far less than from the natural diseases; vaccines are safer than just about anything else, including the foods we eat.

In addition, Sweden successfully manufactured its own inactivated polio vaccine without incident (Axelsson, 2004;2012)

In the early 1930s, Prontosil, based on research that various dyes adhered to specific cells, was found to have antibacterial efficacy against *Streptococcus*. In 1935, the active ingredient was found, sulfanilamide, the first of the sulfa drugs still used today (Wikipedia, "Prontosil"). In 1937, jumping on the bandwagon, S.E. Massengill Company marketed Elixir Sulfanilamide, a sweet tasting concoction with diethylene glycol (anti-freeze) as the liquid within which the sulfanilamide was dissolved. At least 100 deaths were blamed on the medication. "The public outcry caused by this incident and other similar disasters led to the passing of the 1938 Federal Food, Drug, and Cosmetic Act" (Wikipedia, "Elixir sulfanilamide"; Hiltz, 2003, pp.89-93)

Using Stone's cherry-picking illogic, should we abandon antimicrobials because of an incident that happened almost 80 years ago? Or, as tragic as it and the Cutter incident were, should we look at developments since then? If we were to use Stone's approach, given that just about any and all medical interventions involved problems and even tragedies some time in the past, should we abandon all or, at least, most medicine?

Of course, Stone writes on a website that promotes complementary and alternative medicines which aren't regulated, even for ingredients or purity (investigations of production facilities have found contaminants, etc.), by vendors that base their claims on personal testimonies, anecdotes, and on occasion a rare, usually not replicated research publication. It would take another extensive article to discuss the problems with complementary and alternative medicines. For those interested, I suggest starting with:

Cohen PA (2014 Apr 3). Hazards of hindsight—Monitoring the safety of nutritional supplements. *New England Journal of Medicine*; 370(14): 1277-1280. Available at: <http://www.nejm.org/doi/full/10.1056/NEJMp1315559>

FDA (2010 Dec). Tainted Products Marketed as Dietary Supplements. Available at: <http://www.fda.gov/downloads/ForConsumers/ConsumerUpdates/UCM236998.pdf>

Lipson, Peter (2009 Jun 20). DSHEA: a travesty of a mockery of a sham. *Science-Based Medicine*. Available at: <https://www.sciencebasedmedicine.org/dshea-a-travesty-of-a-mockery-of-a-sham/>

Offit, Paul A (2013). *Do You Believe In Magic? The Sense and Nonsense of Alternative Medicine*. Harper.

Singh, Simon & Ernst, Edzard (2008). *Trick or Treatment: The Undeniable Facts About Alternative Medicine*. Norton.

New York Attorney General Eric T. Schneiderman (2015 Feb 3). A.G. Schneiderman Asks Major Retailers To Halt Sales Of Certain Herbal Supplements As DNA Tests Fail To Detect Plant Materials Listed On Majority Of Products Tested. Available at: <http://www.ag.ny.gov/press-release/ag-schneiderman-asks-major-retailers-halt-sales-certain-herbal-supplements-dna-tests>

Ventola CL (2010 Sep). Current Issues regarding Complementary and Alternative Medicine (CAM) in the United States - Part 2 - Regulatory and Safety Concerns and Proposed Governmental Policy Changes with Respect to Dietary Supplements. *Pharmacy and Therapeutics*; 35(9): 514-522. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2957745/pdf/ptj35_9p514.pdf

Whether one chooses to believe in complementary and alternative medicines or not, the main point is that Stone and other antivaccinationists find NO problem with making money from them. It seems that the making of money isn't the problem with them as long as the vendor agrees with them or they agree with the vendor. Hypocrisy rears its ugly head.

The claim made by many antivaccinationists that vaccine advocates have stated that vaccines are completely safe is a straw man. It is a clear demonstration of the mentality of many antivaccinationists, needing to see the world as absolutes, in black and white, not as scientists and public health experts see it as

benefits and risks based on well-researched probabilities. And when they state that vaccine safety has not been researched, extensively so, they are sorely mistaken.

The Psychology of Antivaccinationists: It would take us too far afield to discuss why Stone and other antivaccinationists have formed their opinions and why they persist despite overwhelming evidence to the contrary. Perhaps, at a later date, I will devote an entire article to the “psychology” of people who maintain irrational beliefs; but until then, I give the following as food for thought:

1. Most of these writers lack education and training in the fields that are the subjects of their fixation; yet, believe (as apparent in the writings of Stone and other antivaccinationists) that they are as knowledgeable as professionally trained specialists in the fields in question. In fact, Stone, for instance, gives NO indication he has even attempted to learn the basics.
2. Simple, black and white answers to complex, distressful problems is psychologically satisfying, even if potentially dangerous.
3. The beliefs of antivaccinationists are reinforced by participating in “homogeneous clusters, i.e., “echo chambers.” (Del Vicario, 2016). The blind leading the blind in a closed self-reinforcing circle.
4. A need to feel important and be part of a community is probably part of the reason. Take John Stone as an example. By writing articles on the Internet, he gets the affirmation he needs, even if it comes from people as illogical and deficient in science as he is. Notably, I could find no articles published by him in peer-reviewed scientific journals or other respected journals/magazines.
5. After devoting so much time and energy to their beliefs, admitting, regardless of the strength of any evidence, that they are wrong would be devastating to their self-esteem and would relegate them once more to anonymity, e.g., “Most people, when directly confronted by evidence that they are wrong, do not change their point of view or course of action but justify it even more tenaciously.” (Tavris, 2007, p.2)
6. Finally, see the Dunning-Kruger Effect discussed below.

Summary and Discussion

Stone, as an editor and major contributor to *Age of Autism*, repeats the antivaccinationists trope of 10,000 vaccines, a clear display of poor scholarship, taking things out of context, deficient science, and a lack of common sense which carries on in his use of the Milgram Experiments. His knowledge of the Milgram Experiments appears to be based only on one article he found in a popular magazine and on a movie clip. Based on his writings on the Milgram Experiments, it does not appear that he even bothered to read the original articles, and isn't aware that it wasn't the Milgram experiment; but Experiments. If he had accessed the original articles, he would have found the study procedures and results to be quite different from the description in *Psychology Today*. Different enough to make him guilty of the False Analogy Fallacy, a logical fallacy that occurs when applying facts from one situation to a substantially different situation, precluding the ability to draw a logical conclusion (Rational Wiki. “False analogy”)

He continues to display faulty reasoning, actually a display of hypocrisy, when attacking the profit motive behind vaccines. He and other antivaccinationists seem to have NO problem with the purveyors of complementary and alternative medicines making profits, so it seems that the making of profits is only unacceptable when selling something Stone and other antivaccinationists disagree with. Of course doctors get paid for giving vaccinations. Should they give them for free? As a further display of his ignorance, Stone doesn't seem to be aware that the profit margin for vaccines pales in comparison to other pharmaceuticals and that the amount doctors make on administering vaccines is, at best, marginal. In fact, some doctors

take a loss on vaccinations. And finally, Stone goes back 60 years in time to the Cutter Incident where approximately 200 people, mainly children, were paralyzed from an inadequately killed vaccine and thousands more exposed. Stone is either unaware of or intentionally ignores that this incident led to ever-increasing safety regulations and surveillance of vaccines. If one were to use Stone's approach to medicine, since many beneficial medicines and interventions had problems years ago, much of modern medicine would be rejected. In fact, historically, one can find problems with much of modern technology. Is Stone's approach even rational? And, again, *Age of Autism* chooses to repost Stone's article as an example of "The Best of Age of Autism."

Given Stone's supreme confidence, in spite of the many basic errors and problems in his article, his writing reminds me of the Dunning-Kruger Effect:

The Dunning-Kruger effect, named after David Dunning and Justin Kruger of Cornell University, occurs where people fail to adequately assess their level of competence — or specifically, their incompetence — at a task and thus consider themselves much more competent than everyone else. This lack of awareness is attributed to their lower level of competence robbing them of the ability to critically analyse their performance, leading to a significant overestimate of themselves. Put more crudely, they're too stupid to realize they're stupid.

The effect can also be summarised by the phrase "a little knowledge is a dangerous thing." A small amount of knowledge can mislead a person into thinking that they're an expert because this small amount of knowledge isn't a well known fact. (Rational Wiki, "Dunning-Kruger Effect")

Note that I have probably read ALL the Dunning-Kruger papers and that the Rational Wiki articles includes a good reference list.

In many cases, antivaccinationists may be quite intelligent. Who knows, maybe they have higher IQs than mine. I don't claim to be a genius. I have an extensive education, including a PhD, and continue to read daily. However, I don't assume just because I am reasonably intelligent and well-educated in specific subject areas that I can make decisions in other areas with minimal effort. Intelligence is only the start. Mastering a subject takes a lot of time and effort. Even being able to make "intelligent" statements involves learning some of the basics, something not displayed by Stone and other antivaccinationists. And a *sine qua non* of my approach is to NOT rely on second-hand information, or one or two papers. And I never assume that I am absolutely right, that I have some sort of god-like perfect knowledge.

On the contrary, despite my education and extensive reading, when not certain about something, I don't hesitate to ask others, specifically requesting a no-holds-barred critique of what I write. Each of my articles for ECBT are reviewed by numerous people, experts in various areas. Unfortunately, some have agreed to review my articles only with the promise of remaining anonymous. And, I take comments/critiques seriously, even those posted by antivaccinationists. If they refer to article(s), I try to obtain them. However, I know how to evaluate methodologies and, if uncertain, I go further and try to obtain articles referred to in the articles referred to by antivaccinationists and search for related studies. Quite time consuming, but I take what I do seriously. I have NO vested interest. If I were to come across information that I consider valid and reliable, not just one or two papers, I would adjust my thinking. However, so far, all I have seen is that antivaccinationists are the epitome of the Dunning-Kruger Effect. In addition, Stone and other antivaccinationists display an incredible lack of ethics in their personal attacks on anyone who

disagrees with them (see my previous article for ECBT, Harrison, 2016b). Whereas the Rational Wiki article states: “they're too stupid to realize they're stupid,” given their incredible lack of decency and ethics together with their willful ignorance, in my opinion they are too stupid on steroids.

Conclusion

Stone repeats the antivaccinationists' trope of 10,000 vaccines, ignoring context and a clear display of lack of common sense. As an analogy, imagine a 15 - 20 minute lecture or 2,500 word article about research into potentially almost limitless energy. The last sentence states: “Our research indicates we could theoretically put 10,000 gallons of gasoline in your car tank.” The average gas tank holds probably up to 25 gallons. Given Stone's lack of common sense, I assume he would take the 10,000 gallons literally. Most rational people would understand, even without context, that the 10,000 gallons did not refer to actual gallons of gasoline but to the energy/mileage equivalent. The physical impossibility of giving 10,000 vaccines at once to an infant or anyone together with the exponential leap from the current 17 vaccines, there not even being remotely so many microbes that vaccines would ever be developed for, says it all. And there you have John Stone and the Best of Age of Autism in a NUTshell!

One last thought: this isn't my first paper for ECBT that deals with John Stone. If nothing else, he is consistent in his willful ignorance. (See Harrison, 2015)

Acknowledgments

For valuable feedback and suggestions, thanks to: Sandi Berman, PLS, Dorit Rubinstein Reiss, PhD, and Steven A. Rubin, PhD.

References

- American Academy of Pediatrics (2008 Oct). The Childhood Immunization Schedule: Why Is It Like That? Available at: <https://www.aap.org/en-us/advocacy-and-policy/Documents/Vaccineschedule.pdf>
- American Academy of Pediatrics (2012a). Red Book: 2012 Report of the Committee on Infectious Diseases (29th Edition). Available at: https://redbook.solutions.aap.org/DocumentLibrary/RB12_interior.pdf
- American Academy of Pediatrics (2012b Mar). The business case for pricing vaccines. Available at: https://www.aap.org/en-us/Documents/immunizations_thebusinesscase.pdf
- American Diabetes Association (2016 Jan). Standards of medical care in diabetes. *Diabetes Care*; 39(Suppl.1): S1-S112. Available at: http://care.diabetesjournals.org/content/suppl/2015/12/21/39.Supplement_1.DC2/2016-Standards-of-Care.pdf
- Axelsson, Per (2004). Höstens spöke: De svenska polioepidemiernas historia.[The Autumn Ghost: The History of Polio Epidemics in Sweden]. Carlssons. Available at: <https://www.diva-portal.org/smash/get/diva2:142617/FULLTEXT01.pdf>
- Axelsson P (2012). Swedish polio vaccine, 1952-1957. *Dynamis*; 32(2): 311-328. Available at: http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S0211-95362012000200003

Barkun, Michael (2013). *A Culture of Conspiracy: Apocalyptic Visions in Contemporary America* (2nd Edition). University of North Carolina Press.

Baylor, Norman W, Marshall, Valerie B (2013). Chapter 73: Regulation and Testing of Vaccines. In Plotkin, Stanley, Orenstein, Walter A, Offit, Paul A (Eds.) *Vaccines*, 6th Edition. Elsevier: 1425-1446.

Blass, Thomas (2002 Mar 1) - Thomas Blass probes into the life of Stanley Milgram, the man who uncovered some disturbing truths about human nature. *Psychology Today*. Available at: <https://www.psychologytoday.com/articles/200203/the-man-who-shocked-the-world>

Carroll, Robert Todd (Accessed 2016 Dec 10). "false analogy". Available at: <http://skepdic.com/falseanalogy.html>

CDC (1999 Apr 2). Achievements in Public Health, 1900-1999 Impact of Vaccines Universally Recommended for Children — United States, 1990-1998. *MMWR Weekly*; 48(12): 243-248. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/00056803.htm>

CDC (2015a). Appendix E: Reported Cases and Deaths from Vaccine Preventable Diseases, United States, 1950-2013; E1-E6 in *Epidemiology and Prevention of Vaccine-Preventable Diseases: The Pink Book* - 13th Edition. Available at: <http://www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/E/reported-cases.pdf>

CDC (2015b). Appendix E: Impact of Vaccines in the 20th & 21st Centuries: E7.in *Epidemiology and Prevention of Vaccine-Preventable Diseases: The Pink Book* - 13th Edition. Available at: <http://www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/E/impact.pdf>

CDC (2015c). *Epidemiology and Prevention of Vaccine-Preventable Diseases: The Pink Book* - 13th Edition. Available at: <http://www.cdc.gov/vaccines/pubs/pinkbook/safety.html>

CDC (2015d). Chapter 4: Vaccine Safety. in *Epidemiology and Prevention of Vaccine-Preventable Diseases: The Pink Book* - 13th Edition. Available at: <http://www.cdc.gov/vaccines/pubs/pinkbook/safety.html>

CDC Advisory Committee on Immunization Practices, American Academy of Pediatrics, American Academy of Family Physicians, American College of Obstetricians and Gynecologists (2016). Recommended Immunization Schedules for Person Aged 0 Through 18 Years: UNITED STATES, 2016. Available at: <http://www.cdc.gov/vaccines/schedules/downloads/child/0-18yrs-child-combined-schedule.pdf>

CDC (accessed 2016 Jan 31). Immunizations and Developmental Milestones for Your Child from Birth Through 6 Years Old. Available at: <http://www.cdc.gov/vaccines/parents/downloads/milestones-tracker.pdf>

Cohn, Melvin & Langman, Rodney E. (1990). The Protecton: The Unit of Humoral Immunity Selected by Evolution. *Immunological Review*; No. 115: 7-147.

Decker, Michael D, Edwards, Kathryn M, Bogaerts, Hugues H (2013). Chapter 40: Combination Vaccines. In Plotkin, Stanley, Orenstein, Walter A, Offit, Paul A (Eds.) *Vaccines*, 6th Edition. Elsevier: 981-1007.

Del Vicario *et al.* (2016 Jan 20). The spreading of misinformation online. *PNAS Early Edition*; 13(3): 554-559. Available at: <http://www.pnas.org/content/113/3/554>

FDA. About FDA: Significant Dates in U.S. Food and Drug Law History. Available at: <http://www.fda.gov/AboutFDA/WhatWeDo/History/Milestones/ucm128305.htm>

FDA (updated 2015 Dec). Complete List of Vaccines Licensed for Immunization and Distribution in the US. Available at: <http://www.fda.gov/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM093833>

Fearnside, W. Ward and Holther, William B (1959). “Fallacy: The Counterfeit of Argument”, Prentice-Hall.

Fitzpatrick, Michael (2004). *MMR and Autism: What Parents Need to Know*. New York: Routledge.

Freed GL, Cowan AE, Clark SJ (2009 Dec). Primary care physician perspectives on reimbursement for childhood immunizations. *Pediatrics*; 124(Suppl 5): S466-S471. Available at: http://pediatrics.aappublications.org/content/124/Supplement_5/S466.long

Gomez, Philip L, Robinson, James M, Rogalewics, Joseph A (2013). Chapter 4: Vaccine manufacturing. In Plotkin, Stanley, Orenstein, Walter A, Offit, Paul A (Eds.) *Vaccines*, 6th Edition. Elsevier: 44-57.

Halsey, Neal A (2001). Safety of combination vaccines: perception *versus* reality. *Pediatric Infectious Diseases Journal*; 20: S40-4.

Harrison, Joel A (2016a Mar 18). Ignoring Context and a Lack of Common Sense: Antivaccinationists Absurdly Misusing Dr. Paul Offit’s “each infant would have the theoretical capacity to respond to about 10,000 vaccines at any one time”. *Every Child By Two*. Available at: http://www.ecbt.org/images/articles/Ignoring_Context_and_a_Lack_of_Common_Sense_-_10,000_Vaccinations_at_One_Time_.pdf

Harrison, Joel A (2016b Dec 6). *Ad Hominem* Attacks Against Investigative Journalist Brian Deer: A Clear Example of Antivaccinationists' Inability to Address the Issues, Poor Scholarship, and Just Plain Unethical Behavior. *Every Child By Two*. Available at: http://www.ecbt.org/images/articles/Ad_Hominem_Attacks_Against_Investigative_Journalist_Brian_Deer.pdf

Hart, Elizabeth (2016 Jan 7). Comment following John Stone’s (2016 Jan 5) “Bexsero: More Questions for the British and Scottish Governments Over Vaccines Committee Chair. *Age of Autism*. Available at: <http://www.ageofautism.com/2016/01/bexsero-more-questions-for-the-british-and-scottish-governments-over-vaccine-committee-chair.html>

Hilts, Philip J (2003). *Protecting America’s Health: The FDA, Business, and One Hundred Year of Regulation*. New York: Alfred A. Knopf.

Institute of Medicine (2003). *Financing Vaccines in the 21st Century: Assuring Access and Availability*. Washington, D.C.: The National Academies Press. Available at: <http://www.nap.edu/catalog/10782/financing-vaccines-in-the-21st-century-assuring-access-and-availability>

KidsHealth (2016). Immunization Schedule. Available at: <http://kidshealth.org/en/parents/immunization-chart.html?view=ptr&WT.ac=p-ptr>

Kroger, Andrew T, Atkinson, William L, Pickering, Larry K (2013). Chapter 8: General immunization practices. In Plotkin, Stanley, Orenstein, Walter A, Offit, Paul A (Eds.) *Vaccines*, 6th Edition. Elsevier: 93-99.

Marston, Wendy (1999 Feb 23). Scientist at Work: Charles Gerba; On Germ Patrol, at the Kitchen Sink. *New York Times*. Available at: <http://www.nytimes.com/1999/02/23/health/scientist-at-work-charles-gerba-on-germ-patrol-at-the-kitchen-sink.html?pagewanted=print>

Milgram, Stanley (1963). Behavioral study of obedience. *Journal of Abnormal and Social Psychology*; 67(4): 371-378. Available at: <http://psycnet.apa.org/psycinfo/1964-03472-001>

Milgram, Stanley (1965). Some conditions of obedience and disobedience to authority. *Human Relations*; 18: 57-76. Available at: <http://www.lucs.lu.se/wp-content/uploads/2015/02/milgram-some-conditions-of-obedience-and-disobedience-to-authority-1965.pdf>

National Committee for Quality Assurance (accessed 2016 Feb 17). HEDIS® and Quality Compass®. What is HEDIA? Available at: <http://www.ncqa.org/HEDISQualityMeasurement/WhatIsHEDIS.aspx>

National Health Service, England (2013). General Medical Services Statement of Financial Entitlements Directions 2013. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/233366/gen_med_servs_statement_financial_entitlements_directions_2013_acc.pdf

National Vaccine Information Center (2016). Vaccine. Available at: <https://www.nvic.org/Downloads/49-Doses-PosterB.aspx>

[news.com.au](http://www.news.com.au) (2013 Mar 27). The shocking bacteria count of daily items. Available at: <http://www.news.com.au/lifestyle/home/the-shocking-bacteria-count-of-daily-items/story-fneuz5ql-1226606341167>

Nordqvist, Richard (updated 2014 Dec 21). false analogy. *About Education*. Available at: <http://gram-mar.about.com/od/fh/g/falseanalogyterm.htm>

Nuckles, Ben (2016 Dec 9). Conspiracy Theories: ‘Pizzagate’ Shooting Just a False Flag. *The New York Times*.

Offit, Paul (2002 Jan). Addressing Parents’ Concerns: Do Multiple Vaccines Overwhelm or Weaken the Infant’s Immune System? *Pediatrics*; 109(1): 124-129. Available at: <http://pediatrics.aappublications.org/content/pediatrics/109/1/124.full.pdf>

Offit, Paul (2005). *The Cutter Incident: How America’s First Polio Vaccine Led To The Growing Vaccine Crisis*. Yale University Press.

Offit, Paul (2008 Jun 18). Are Childhood Vaccines Safe? Available on YouTube at: <https://www.youtube.com/watch?v=dQQ7izQOPdw>

Park, Alice (2015 Dec 28). Babies in the Womb Aren’t So Sterile After All. *Time Magazine*. Available at: <http://time.com/4159249/baby-microbiome-womb/>

Plotkin, Stanley, Orenstein, Walter A, Offit, Paul A (Eds.) *Vaccines*, 6th Edition. Elsevier

http://www.ecbt.org/index.php/facts_and_issues/article/john_stone_and_the_best_of_age_of_autism_just_plain_wrong_about_everything 22

Rational Wiki, “Dunning-Kruger effect” Available at: http://rationalwiki.org/w/index.php?title=Dunning-Kruger_effect&printable=yes

Rational Wiki. “False analogy” Available at: http://rationalwiki.org/wiki/False_analogy

Roush, Sandra W, Murphy, Trudy V et al. (2007). Historical Comparisons of Morbidity and Mortality for Vaccine-Preventable Diseases in the United States. *JAMA*; 298(18): 2155-2163.

Sompayrac, Lauren (2016). *How The Immune System Works*, 5th Edition. Wiley Blackwell.

Stobbe, Mike (2008 Dec 1). Physicians rethinking costly kids’ vaccines. *Associated Press*.

Stone, John (2010 May 10). Paul Offit’s 10,000 Vaccines and the Milgram Experiment. *Age of Autism*. Available at: <http://www.ageofautism.com/2010/05/paul-offits-10000-vaccines-and-the-milgram-experiment.html>

Stone, John (2011a Jan 3). Best of Age of Autism: Paul Offit, Social Control and the Deadly Choices of Yale’s Milgram Experiment. *Age of Autism*. Available at: <http://www.ageofautism.com/2011/01/best-of-age-of-autism-paul-offit-social-control-and-the-deadly-choices-of-yales-milgram-experiment-.html>

Stone, John (2011b Oct 25). Best of Age of Autism: Paul Offit and the Milgram Experiment. *Age of Autism*. Available at: <http://www.ageofautism.com/2011/10/best-of-age-of-autism-paul-offit-and-the-milgram-experiment.html>

Stone, John (2015 Jun 18). Best of AofA: Offit and Milgram and Social Manipulation. *Age of Autism*. Available at: <http://www.ageofautism.com/2015/06/best-of-aofa-the-milgram-experiment.html>

Stone, John (2016 Jan 10). Bexsero: More Questions for the British and Scottish Government Committee Chair. *Age of Autism*. Available at: <http://www.ageofautism.com/2016/01/bexsero-more-questions-for-the-british-and-scottish-governments-over-vaccine-committee-chair.html>

Toumey, Christopher P. (1996), “Conjuring Science: Scientific Symbols and Cultural Meanings in American Life”, Rutgers University Press

Vaccine Education Center, The Children’s Hospital of Philadelphia (reviewed by Paul A. Offit, 2014 Nov 5). “Vaccine Safety: Immune System and Health: Vaccines impact on the immune system: Do vaccines overwhelm the immune system? Available at: <http://www.chop.edu/centers-programs/vaccine-education-center/vaccine-safety/immune-system-and-health#.VpfcwjYlenQ>

Vidor, Emmanuel, Plotkin, Stanley A (2013). Chapter 27: Polio Vaccine—Inactivated. In Plotkin, Stanley, Orenstein, Walter A, Offit, Paul A (Eds.) *Vaccines*, 6th Edition. Elsevier: 27.

WHO (2016 Jan). Vaccines and diseases. Available at: <http://www.who.int/immunization/diseases/en/>

Wikipedia. “Argument from analogy.” Available at: https://en.wikipedia.org/wiki/Argument_from_analogy

Wikipedia. “Elixir sulfanilamide” Available at: https://en.wikipedia.org/wiki/Elixir_sulfanilamide

http://www.ecbt.org/index.php/facts_and_issues/article/john_stone_and_the_best_of_age_of_autism_just_plain_wrong_about_everything 23

Wikipedia Experimenter (film). Available at: [https://en.wikipedia.org/wiki/Experimenter_\(film\)](https://en.wikipedia.org/wiki/Experimenter_(film))

Wikipedia. “Prontosil” Available at: <https://en.wikipedia.org/wiki/Prontosil>

Wilson, Michael (2005). *Microbial Inhabitants of Humans: Their Ecology and Role in Health and Disease*. Cambridge University Press.

www.whale.to (Accessed 2016 Dec 8). Paul Offit’s 10,000 vaccines at once. Available at: <http://www.whale.to/vaccines/offit23.html>